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dimensional disturbances. Hence, it is sufficient to consider only two-dimensional disturbances.

If the steady-state velocities involved in the problem are low compared with the velocity of sound, it is considered that the disturbance is isochoric and, therefore (for the two-dimensional disturbance),

$$u' + i\alpha v = 0$$

The two-dimensional disturbance equations therefore become

$$\textit{Continuity: } -iv\rho + \bar{\rho}'u + (\rho U)' = 0$$
$$u' + i\alpha v = 0$$

$$\textit{Force: } \bar{\rho}[(U' - iv)u + Uu'] + \rho UU' =$$
$$-\bar{p}' + \bar{\mu}[u'' - \alpha^2 u] + \bar{\mu}'[2u'] + \frac{4}{3}[\mu U'' + \mu' U']$$

$$\bar{\rho}[-ivv + Uv'] = -i\alpha\bar{p} + \bar{\mu}[v'' - \alpha^2 v] +$$
$$\bar{\mu}'[v' + i\alpha u] - \frac{2}{3} i\alpha\mu U'$$

For the isochoric disturbance, the energy equation need not be considered. However, it is necessary to define an equation of state for μ. If it is assumed that the disturbance does not affect the flame structure, then it follows that $\bar{\mu} = \bar{\mu}(\bar{\rho})$ and $\mu = \rho(d\bar{\mu}/d\bar{\rho})$. The boundary conditions for the disturbance are that $u(\pm\infty) = 0$ or that

$$u'(-\infty)/u(-\infty) = \alpha; \quad u'(+\infty)/u(+\infty) = -\alpha$$

Since two boundary conditions fully determine the problem, the general solution consists of a combination of two linearly independent solutions.

$$u = C_1 u_1 + C_2 u_2$$

The formal statement of the eigenvalue problem in dimensionless form can therefore be given as follows:

$$F(\alpha, \nu, R) = \begin{vmatrix} u_1'(-\infty) - \alpha u_1(-\infty) & u_2'(-\infty) - \alpha u_2(-\infty) \\ u_1'(+\infty) + \alpha u_1(+\infty) & u_2'(+\infty) + \alpha u_2(+\infty) \end{vmatrix} = 0$$

When detailed laminar, steady-state flame data become available, calculations can be performed.

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